

# I N S T R U C T I O N   M A N U A L

for

## IMPERIAL II DISC RECORDER

Before attempting to operate the unit, please familiarize yourself with the instructions.

### CONTENTS:

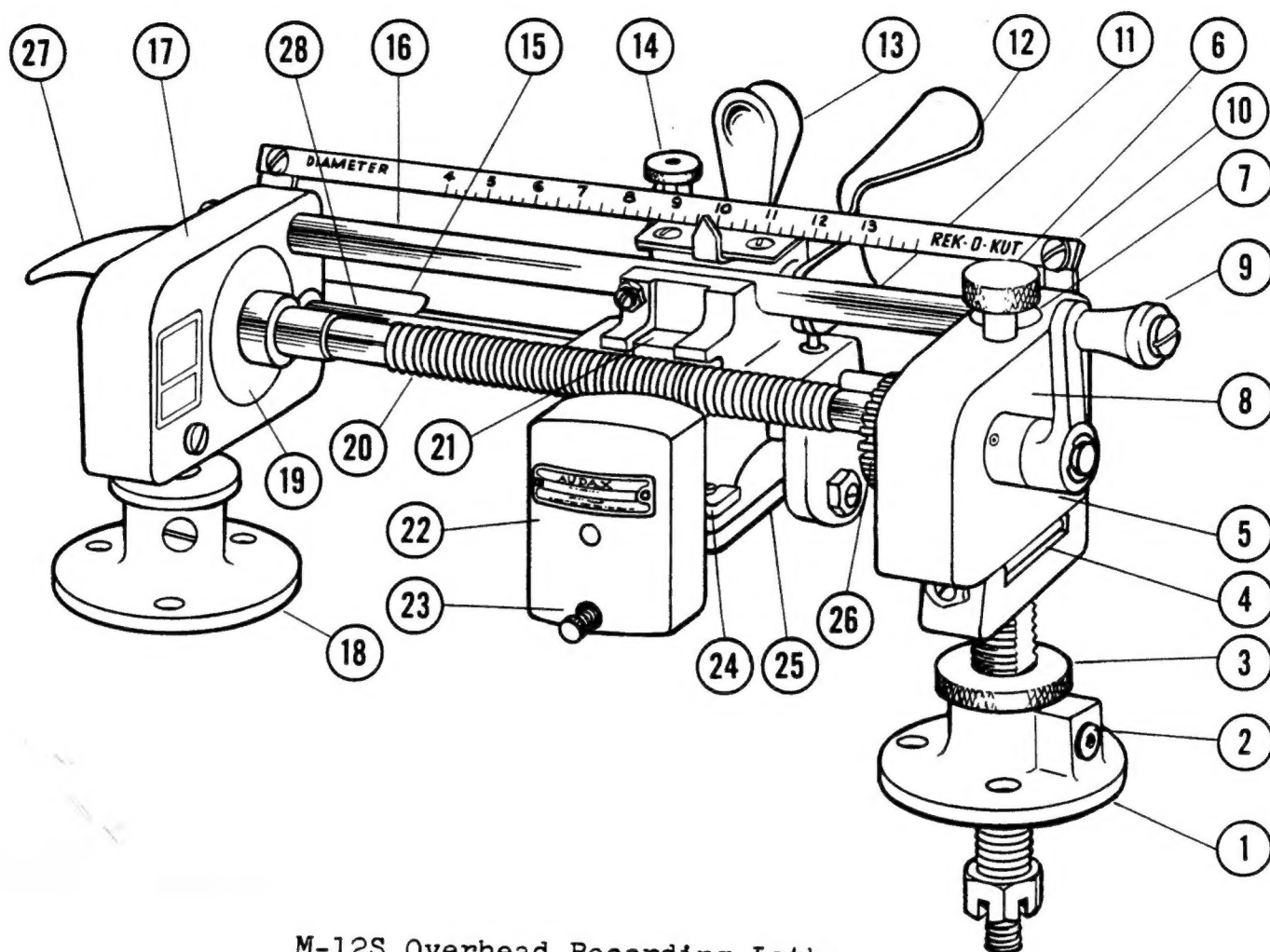
This instruction manual is composed of three parts, or manuals:

- a. M-12S Overhead Lathe
- b. TR-12H Recording Turntable and R-8B Recording Amplifier
- c. S-120 - 12" Playback Arm

The above units are sold individually or packaged as two units known as the "Imperial II Disc Recorder".

REK-O-KUT COMPANY, INC.  
38-19 108th Street  
Corona 68, New York

INTERIM COPY



M-12S Overhead Recording Lathe

(12")

- |                          |                        |
|--------------------------|------------------------|
| 1. Mount Flange          | 14. Depth Control Nut  |
| 2. Elevating Lockscrew   | 15. Automatic Lift     |
| 3. Elevating Wheel       | 16. Slide Bar          |
| 4. Swivel                | 17. Front Bearing      |
| 5. End Bearing           | 18. Drive Flange       |
| 6. Center Lockscrew      | 19. Gear Cap           |
| 7. Lockscrew Cap         | 20. Leadscrew          |
| 8. Adjustable Center     | 21. Half Nut           |
| 9. Crank                 | 22. Cutter             |
| 10. Scale                | 23. Stylus Thumb Screw |
| 11. Half Nut Pin         | 24. Cutter Mount       |
| 12. Cutter Control Lever | 25. Feed Nut Carriage  |
| 13. Feed Nut Lever       | 26. Crank Gear         |
|                          | 27. Lathe handle       |

# INSTALLATION & OPERATION OF IMPERIAL DISC RECORDER

## FOREWARD

The IMPERIAL II is the world's finest disc recorder. It is built to the precision tolerances found only in the very highest priced professional units. It is a machine you will be proud to own and operate.

Instructions for operating the unit are simple and concise. A great deal of time and thought was spent in setting down each operation, step by step, to enable you to make a good recording on the first try. DO NOT LET YOUR DESIRE TO RECORD IMMEDIATELY cause you to rush through these instructions without completely understanding each operation. We recommend that after you complete the operations set forth, and believe the recorder is ready, you re-check each step before starting your first recording.

## UNPACKING

1. Place recorder on a table or bench which is firm or level.
2. Unlatch cover which contains speaker and microphone compartment. Swing it a little beyond vertical position, lift it to remove from hinges, and place on floor or table.
3. Take out bottle of oil, cleaning fluid and height gage.
4. Remove turntable by lifting it out of the shaft well.
5. Wipe motor pulley, driving wheels and inside rim of the turntable with a clean cloth dampened with denatured alcohol.
6. Place a few drops of oil into the shaft well - enough to reach the top of the ball as indicated in drawings. Gently replace turntable.
7. Remove fastenings from cutting unit and shift knob.
8. Unscrew knurled stud holding cutting mechanism to rest stand by turning counterclockwise, and remove.
9. Replace stud in same hole in rest stand from underneath by screwing it back a few turns. This will prevent loss or misplacement.
10. Plug line cord into 115 volt 60 cycle A.C. CAUTION: If you are not sure of the voltage or frequency, check with your dealer or the power company. Incorrect voltage will result in damage to the unit.

## DEFINITION OF RECORDING TERMS:

1. MONITORING: Is the act of listening to whatever is being recorded during the recording process.
2. DUBBING: Re-recording from tape or disc.
3. BASS: Low notes.
4. TREBLE: High notes.
5. SPIRAL GROOVE: The single groove that connects two recordings on the same disc to permit the pickup on play-back to travel from one to the other automatically.
6. LOCKED GROOVE: Closes the last groove on the recording which prevents the pickup on playback from sliding across the record at the end of the selection.
7. LAND: Space between record grooves.

MAIL IN YOUR GUARANTEE CARD TO ACTIVATE THE WARRANTY

## RECORDING:

It is suggested that you read the small book entitled: "HOW TO MAKE GOOD RECORDINGS". The publisher is Audio Devices, located at 444 Madison Avenue in New York City. The book is priced at about \$2.00. There are many excellent hints and simple explanations - all of which will be of invaluable help in making good recordings.

### INPUTS:

- 1) Microphone: For use with high impedance microphone. Has separate volume control. (Use Amphenol Connector Plug #75-MCIF).
- 2) Tuner: Input impedance of 5000 ohms. Output controlled by master volume control. (Use Switchcraft "Tini-Plug" Connector #780).
- 3) Phono: Has separate volume control. Use GE Magnetic cartridge VR II Series or equivalent. (Use Switchcraft "Tini-Plug" Connector #780).
- 4) Tape Head: Has separate volume control, for high impedance head. A tape deck without its own preamplifier should be connected. (Use Amphenol Connector Plug #75-MCIF).

### OUTPUTS:

- 1) Speaker: 4, 8, 16 ohms (Use Switchcraft "Littel-Plug" #440).
- 2) Monitor: High Impedance Head Phones (Use Switchcraft "Littel-Plug" #440).
- 3) Cutter: 4, 8, 16 ohms (Plug Supplied).
- 4) Pre-Amp Output: 1 Volt; for external amplifier (Use Switchcraft "Littel-Plug" #440).

### TO RECORD:

- 1) Turn amplifier switch to "ON" position. The recording meter will light, indicating that the amplifier is operating. The recording meter will always remain illuminated, whether or not the amplifier is in "Record" or "Playback" position.
- 2) Move the selector switch to the "Record" position. Using either the microphone, phono or tuner input, vary the individual volume controls until the pointer of the recording meter fluctuate in the green portion of the scale. The pointer may swing to the extreme right (red area) on peaks; however, this will not impair the recording as long as the average movement is in the designated

To suit individual requirements or to achieve certain effects, the above controls can be manipulated to suit.

YOUR AMPLIFIER IS NOW READY TO MAKE YOUR FIRST RECORDING WITH THE MICROPHONE OR RADIO. THESE ARE BASIC INSTRUCTIONS.

#### INTRODUCTION:

The following data explains the recording facilities and how to use them. With experience you will learn how to mix the low and high notes to give the best results.

#### MONITORING:

Employ high impedance headphones when recording. Plug into "Monitor" jack.

#### BASS AND TREBLE CONTROLS:

1. The controls marked "Treble" and "Bass" enable you to emphasize or de-emphasize bass or treble to suit individual requirements.
2. By turning the "Treble" control knob to the right toward "Max.", the high notes are emphasized (to +25 db); to the left, toward "Min.", they are de-emphasized (to -27 db).
3. By turning the "Bass" controls toward "Max.", the low notes are emphasized (to +22 db); to the left, toward "Min.", de-emphasized (to -30 db).
4. Leaving both "Treble" and "Bass" at "0", a flat response is obtained.

#### TUNER RECORDING, DUPLICATING RECORDS OR TAPE. ("DUBBING"):

Plug FM or AM radio tuner output into the jack marked "Tuner" to record radio programs. Similarly, record players (without amplifier) may be plugged into "Phono" for special effects, i.e., singing into the microphone with a background of radio or phonograph music. Independent mixing volume controls permit the operator to vary the volume of the singer or the radio. In addition, a high impedance tape head can be connected to "Tape" input of amplifier.

#### PUBLIC ADDRESS:

1. Plug speaker into jack marked "Speaker".
2. Set output selector switch to "Playback".
3. Connect microphone to "Mic." input.

#### PHONO PLAYBACK:

1. Set Output Selector to "Playback".
2. Turn "Phono" Control to increase volume.
3. Set "Bass" and "Treble" controls to desired positions.

#### G. OPERATION OF TURNTABLE:

The overhead cutting mechanism and the turntable were correctly set at the factory for recording on standard aluminum base discs. It should not be necessary to re-adjust the cutting mechanism unless misalignment occurs in transit.

1. Place disc upon turntable, permitting drive pin to protrude through one of the three holes.
2. Grasp cutting mechanism by the handle and swing into position over the center pin of the turntable.
3. Turn drive flange (17) by hand until the aluminum pin snaps into one of the three holes.
4. Start your turntable by loosening black shift knob  $1/4$  of a turn counter-clockwise and slide shift to left to the stop for 78 rpm speed as indicated on escutcheon plate, or to the right for  $33-1/3$ , and tighten knob. The adjustable stops permit adjustment of speed by increasing or decreasing the pressure of the idlers against the turntable. (NOTE INSTRUCTIONS ON LAST PAGE).

NOW FOLLOW M-12S INSTRUCTIONS.

#### MODEL M-12S

#### INTRODUCTION:

The M-12S is a precision built overhead lathe designed specifically to meet the standards of quality recording, ease of handling and minimum maintenance demanded by the professional recordists. Only ordinary care will be required to keep this precise tool in perfect operating condition.

Read your instructions carefully to acquaint yourself with this machine.

#### A. ADJUSTING FOR RECORDING:

1. Place a recording disk on the turntable.
2. Remove cap covering swivel lock screw (7).
3. Insert the short end of the allen key through the hole onto the head of the swivel lock screw. Make a half turn to the left to loosen.
4. Squaring the M-12S to the turntable:
  - a. The slide bar must be parallel to the recording disk at all times...this means that the height of the slide bar from the disk at the drive flange must be the same as at the outer edge of the disc.
  - b. Place a piece of tissue paper on the disc to prevent scratching while the adjustments are being made.
  - c. Turn elevating wheel (3) counter-clockwise to lower the M-12S or clockwise to raise it.
  - d. Tighten elevating lock screw with allen key finger tight. Do not apply hand pressure.

#### B. ALIGNING THE M-12S TO THE DISK:

1. Place the short end of the allen key into the swivel lock screw (7).
2. Loosen by making  $1/2$  turn to the left.
3. Place left hand on top of the M-12S at the driving end.
4. Press down firmly to the disk. Hold in this position, keeping pressure forward by pressing against the inside edge of the center pin.
5. Start the turntable and engage the 78 speed.



6. While the turntable is rotating, tighten the swivel lock with your right hand.
7. Remove your hands from the lathe.
8. Stop the turntable. Leave it in "off" position. DO NOT REMOVE THE LATHE.
9. Alignment Check:
  - a. Spin turntable by hand with lathe in cutting position. Cutter is in "up" position.
  - b. The turntable should slow down gradually if the alignment is correct. A sudden stop indicates that there is a drag caused by the hole in the drive flange pressing against the center pin.
  - c. Lift the lathe off the center pin and replace. If it does not drop on freely, re-align as indicated in previous paragraphs.

#### C. OPERATION:

1. Insert a short shank recording stylus into the RH-5 cutter with the flat of the stylus facing the set screw. Tighten the set screw.
2. Push cutter control lever (12) back to raise the cutter.
3. Swing the lathe back over the turntable into recording position.
4. Grasp the feed nut release lever (13) between thumb and forefinger of right hand and squeeze. This will disengage the feednut from the leadscrew and allow the cutter to be slid along the slide bar.
5. Keep feednut disengaged and push feednut release lever (13) to left or right to slide cutter to a position at which the cutting stylus will be resting above the disc, a quarter of an inch from the outside edge of the blank. Release the feednut.
6. Start your turntable.
7. Grasp the cutter control lever (12) between thumb and forefinger, pull gently toward you to the stop, thereby lowering cutter to the disc.
8. Allow the stylus to cut two or three grooves.
9. Raise the cutter by pushing cutter control lever (12) back. Stop the turntable and examine the groove, to check for the proper depth of cut.
10. To increase the depth of the groove, turn the depth control nut (14) clockwise. If the groove is too deep, turn the nut counter-clockwise. This adjustment is made before you start to record. No further adjustment is necessary during the recording if the same make and quality of disc is used which was used to make the first adjustment. Where a different make or size blank is used, or stylus changed, it will be necessary to re-adjust the depth of cut. It also may be necessary to reset the M-12S according to paragraph "C".

#### D. ANGLE ADJUSTMENT OF STYLUS:

1. Pull cutter lever (12) slowly toward you to lower cutting head with stylus in place gently to the disc.
2. Observe whether the stylus point and its reflection on the blank disc make a vertical line.

3. To adjust, loosen the 2 screws holding the cutter to the cutter mount (24) slightly so that the cutter can be pushed up or down.
4. Adjust cutter so that stylus point and reflection is almost 180 degrees (vertical).
5. Tighten both screws holding cutter.
6. Pull cutter lever forward to lower.
7. Move cutter to extreme right by pressing feednut levers together and pulling to the right.

#### E. HOW TO MAKE A SPIRAL GROOVE:

A spiral groove is made at the start of a recording and at the finish. It acts as a lead-in groove for the second selection to be recorded on the same side. The spiral crank will start to revolve when the turntable is in motion. To make a spiral, grasp the crank and turn it in the same direction in which it is revolving but at a faster speed. The width of the spiral depends entirely upon the speed with which the crank is turned. The crank can be held in one position while the turntable is revolving without damage to your recording. This is a safety feature found only on Rek-O-Kut overhead lathes.

#### F. LOCKED GROOVE:

This operation takes a little practice.

1. Grasp the feednut lever between the thumb and forefinger just before the recording ends.
2. When recording is completed, make a spiral groove with the crank.
3. Squeeze feednut lever together to disengage feednut. Hold in this position while allowing cutter to make 1-1/2 turns.
4. Lift cutter from disc.

#### CAUTION:

Do not permit the cutting head to remain on the disc for more than a turn and a half with the Carriage in a locked position and the halfnut disengaged, otherwise, this will cause the stylus to cut through the disc coating into the record base, thus ruining the stylus.

#### G. TO REMOVE LEADSCREWS:

1. Move cutter to center of leadscrew.
2. Lower cutter to disc without stylus.
3. Remove gear cap (19) from front bearing.
4. Loosen adjustable center lock screw. (6)
5. Pull out adjustable center (8).
6. Grasp crank and pull away from end bearing and hold.
7. Grasp leadscrew at end bearing and lower toward turntable.
8. Pull away from front bearing and remove.
9. Unscrew halfnut pin (11) at rear of carriage to release halfnut.
10. Remove halfnut.



#### H. TO INSTALL LEADSCREWS:

1. Insert halfnut into carriage.
2. Secure in position by screwing in halfnut pin.
3. Insert large gear end of leadscrew into front bearing. Be sure center seats properly on end ball.
4. Pull out crank as described in previous paragraph.
5. Push leadscrew toward rear of end bearing.
6. Release crank. Crank gear & leadscrew must mesh.
7. Insert adjustable center until it holds screw in position.
8. Hold firmly while tightening adjusting center lock screw. There must be no end play.
9. Check for bind by turning drive flange (18) by hand. If it binds, release the adjustable center (8) slightly.

#### I. SETTING THE PROPER STYLUS PRESSURE FOR THE S-120 ARM:

1. Remove the arm from the arm rest clip.
2. With the cartridge installed in the arm, turn the counterweight until the arm is suspended in a state of horizontal balance.

The keyway at the rear of the arm is the indexing mark to keep track of the number of counterweight turns made. Follow the gram weight recommendations of the cartridge manufacturer.

Turning Counterweight clockwise increases stylus pressure; counter clockwise, reduces stylus pressure. Use a stylus gauge to determine accurate stylus pressure.

#### J. TO REMOVE CARTRIDGE SHELL:

- a. Remove cartridge shell by turning lock ring clockwise.
- b. Grasp cartridge shell with fingers and pull forward gently to slide from arm tube.
- c. Replace shell by lining up vertical pin on the shell with slot in arm tube.
- d. Push shell all the way in. Turn lock ring counterclockwise with fingers only, to tighten.

## LUBRICATION

### MODEL TR-12H RECORDING TURNTABLE

Fig. A. Illustrates the Hysteresis Synchronous Motor which is designed with oil-less bearings and saturated wicks. Lubrication of this motor is required after 1,000 hours of operation in temperate climates. The bearing wicks can be saturated with #20 S.A.E. motor oil. A small thin oil can spout is inserted into the slits of the small black rubber pouches which cover the openings of the oil feed tubes, which in turn supply the motor bearings.

#### Fig. B. LUBRICATION OF TURNTABLE SHAFT AND BEARING WELL.

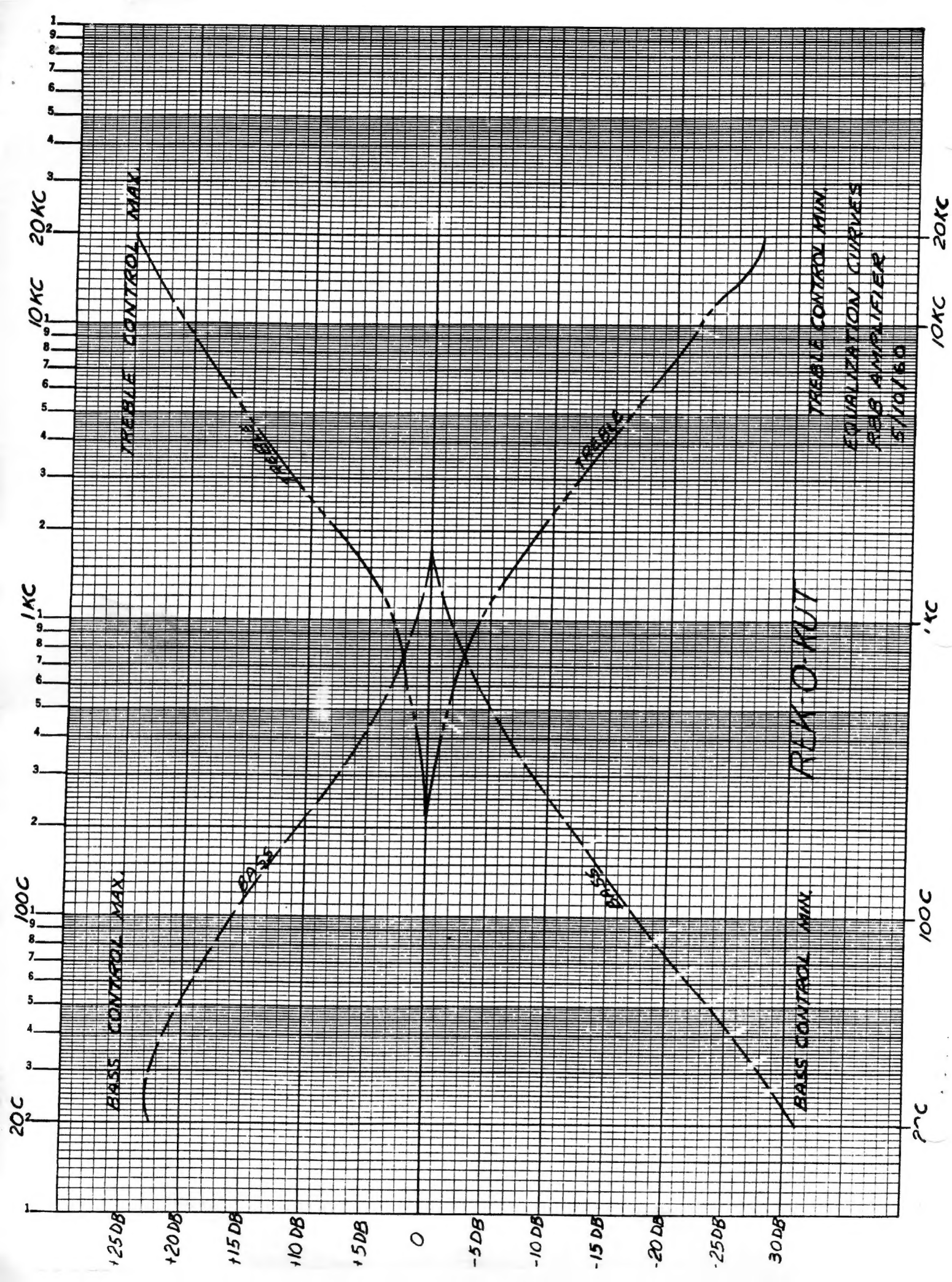
1. Remove turntable by lifting straight up.
2. Remove ball bearing from bottom of bearing well.
3. Wash well and turntable shaft thoroughly with denatured alcohol.
4. Wash ball bearing as in step #3.
5. Lubricate turntable shaft and bearing well with Rek-O-Kut oil which is furnished. This oil is designated as #20 S.A.E. oil.
6. Carefully replace clean ball bearing in bottom of bearing well.
7. Use REK-O-KUT OIL to just cover ball bearing in well .
8. Wash inside rim of turntable with carbon tetrachloride.

#### Fig. C. LUBRICATION OF IDLERS AND IDLER SHAFT.

1. Remove turntable by lifting straight up.
2. Oil the oil wick as indicated in the drawing with REK-O-KUT OIL. The wick should be moist at all times. DO NOT SATURATE.

NOTE:

- If idler wheel does not turn freely, remove idler, wash idler and idler shaft in carbon tetrachloride. Put light layer of oil on shaft. Replace idler and washer on shaft. Oil as described in Fig. C.
3. Wash rims of idlers with denatured alcohol to remove any oil that may be present.
  4. Replace turntable in bearing well by lowering it gently



## OILING DIAGRAMS

### TOP VIEW OF HYSTERESIS SYNCHRONOUS MOTOR

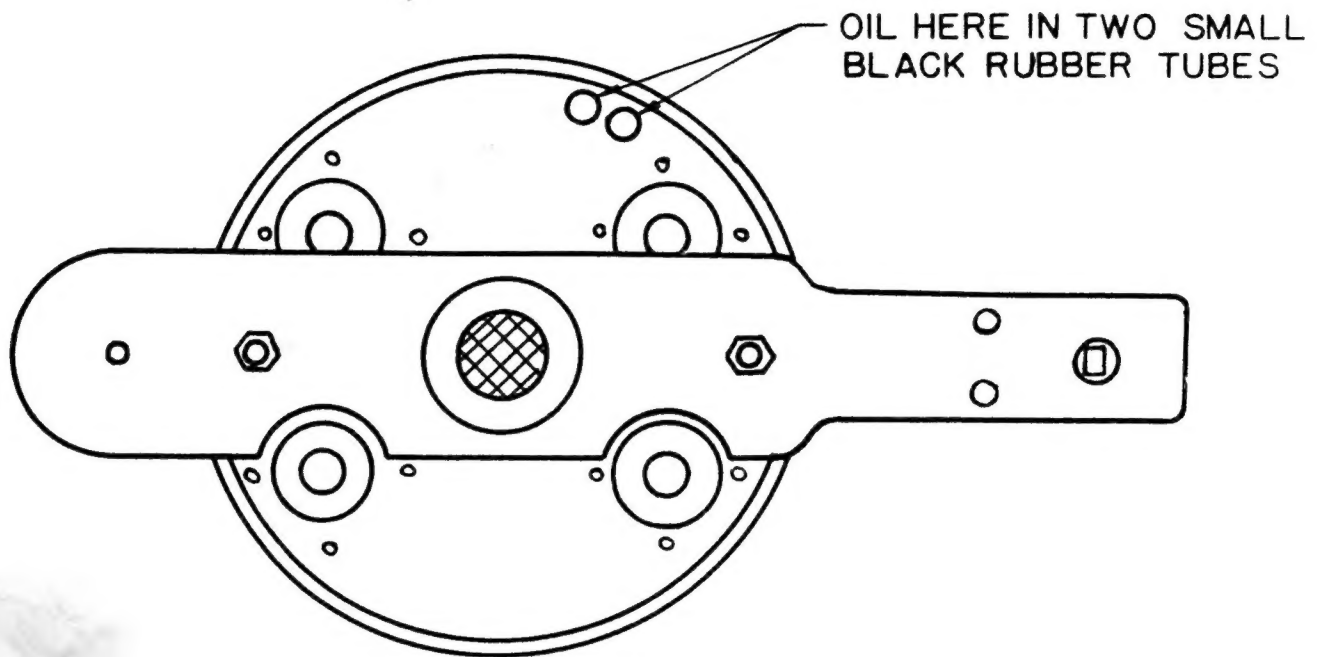


FIG. A

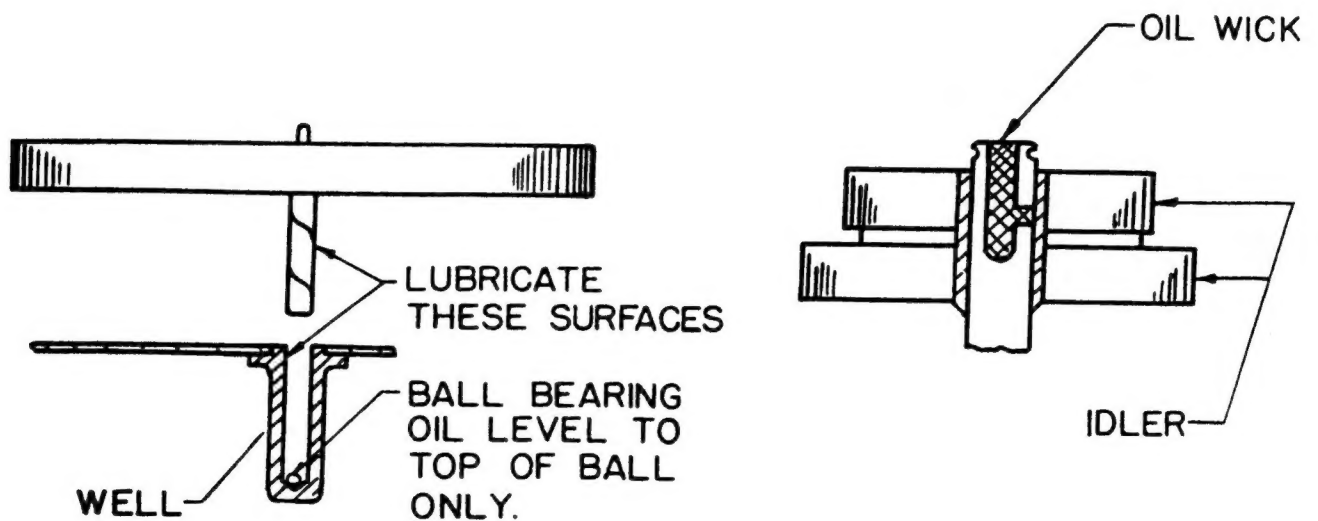


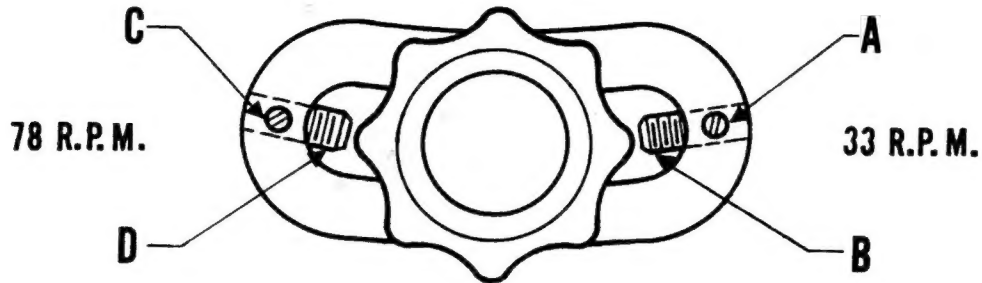
FIG. B

FIG. C

**IDLER PRESSURE AND SPEED ADJUSTMENT FOR  
TURNTABLE MODEL TR-12H, TR-43H**

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Remove turntable by lifting straight up.  
Clean rubber idlers, the inside rim of the turntable and the pulley motor with a clean cloth dipped in denatured alcohol.



To make 33-1/3 and 45 r.p.m. adjustments:

1. Set black control knob in "off" position.
2. Loosen set screw "A".
3. Turn adjustment screw "B" counterclockwise until it clears slot.
4. Move black control knob very slowly to the right. When the turntable begins to move slightly, tighten the knob at that point.
5. Turn adjustment screw "B" clockwise until it meets the control knob.
6. Now turn adjustment screw "B" counterclockwise two turns.
7. Tighten set screw "A".

To make 78 r.p.m. adjustments:

1. Set black control knob in "off" position.
2. Loosen set screw "C".
3. Turn adjustment screw "D" counterclockwise until it clears slot.
4. Move black control knob very slowly to the left. When the turntable begins to move slightly, tighten the knob at that point.
5. Turn adjustment screw "D" clockwise until it meets control knob.
6. Now turn adjustment screw "D" counterclockwise to turns.
7. Tighten set screw "C".